

## ABSTRACT

5 The present invention is a chemical reactor and method for catalytic  
chemical reactions having gas phase reactants. The chemical reactor has reactor  
microchannels for flow of at least one reactant and at least one product, and a  
catalyst material wherein the at least one reactant contacts the catalyst material  
and reacts to form the at least one product. The improvement, according to the  
10 present invention is: the catalyst material is on a porous material having a  
porosity that resists bulk flow therethrough and permits molecular diffusion  
therein. The porous material further has a length, a width and a thickness, the  
porous material defining at least a portion of one wall of a bulk flow path through  
which the at least one reactant passes.

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